CLAIMS

1. A reflective liquid crystal device comprising:

a first substrate;

a transparent second substrate opposed to the first substrate;

a liquid crystal held between the first and second substrates;

a reflecting electrode layer arranged on the first substrate opposite to the second substrate;

a polarizer provided on a side of the second substrate, which is opposite to a first substrate side thereof;

a first retardation plate arranged between the polarizer and the second substrate; and

a second retardation plate arranged between the polarizer and the first retardation plate;

wherein a twist angle of the liquid crystal is 230 to 260 degrees;

a minimum and maximum Δnd (product of optical anisotropy Δn and thickness d) of the liquid crystal are 0.85 μm or less and 0.70 μm or more, respectively;

Δnd of the first retardation plate is 150 ± 50 nm or 600 ± 50 m;

Δnd of the second retardation plate is 550 ± 50 nm;

an angle θ1 formed by a transmission axis or absorption axis of the polarizer and an optical axis of the second retardation plate is 15 to 35 degrees; and

an angle θ2 formed by an optical axis of the first retardation plate and the optical axis of the second retardation plate is 60 to 80 degrees.

2. A reflective liquid crystal device comprising:

a first substrate;

a transparent second substrate opposed to the first substrate;

a liquid crystal held between the first and second substrates;

a reflecting electrode layer arranged on the first substrate opposite to the second substrate;

a polarizer provided on a side of the second substrate, which is opposite to a first substrate side thereof;

a first retardation plate arranged between the polarizer and the second substrate; and

a second retardation plate arranged between the polarizer and the first retardation plate;

wherein a twist angle of the liquid crystal is 230 to 260 degrees;

a minimum and maximum Δnd (product of optical anisotropy Δn and thickness d) of the liquid crystal are 0.85 μm or less and 0.70 μm or more, respectively;

Δnd of the first retardation plate is 150 ± 50 nm;

Δnd of the second retardation plate is 610 ± 60 nm;

an angle $\theta 1$ formed by a transmission axis or absorption axis of the polarizer and an optical axis of the second retardation plate is 10 to 35 degrees; and

an angle $\theta 2$ formed by an optical axis of the first retardation plate and the optical axis of the second retardation plate is 30 to 60 degrees.

3. The reflective liquid crystal device according to Claim 1,

wherein Δnd of the liquid crystal is 0.70 to 0.85 μm.

4. The reflective liquid crystal device according to Claim 2, wherein Δnd of the liquid crystal is 0.70 to 0.85 μm.

5. The reflective liquid crystal device according to Claim 1, further comprising a color filter provided on the liquid crystal side of the first or second substrate.

6. The reflective liquid crystal device according to Claim 2, further comprising a color filter provided on the liquid crystal side of the first or second substrate.

7. The reflective liquid crystal device according to Claim 1, wherein the reflecting electrode layer comprises a single-layer reflecting electrode.

8. The reflective liquid crystal device according to Claim 2, wherein the reflecting electrode layer comprises a single-layer reflecting electrode.

9. The reflective liquid crystal device according to Claim 1, wherein the reflecting electrode layer has a laminated structure comprising a reflecting film, a transparent insulating film arranged on the reflecting film, and a transparent electrode arranged on the insulating film.

10. The reflective liquid crystal device according to Claim 2, wherein the reflecting electrode layer has a laminated structure comprising a reflecting film, a transparent insulating film arranged on the reflecting film, and a transparent electrode arranged on the insulating film.

11. The reflective liquid crystal device according to Claim 1, wherein a passive matrix driving system in a normally black mode is used.

12. The reflective liquid crystal device according to Claim 2, wherein a passive matrix driving system in a normally black mode is used.

13. The reflective liquid crystal device according to Claim 1, wherein unevenness is formed on a surface of the first substrate opposite to the second substrate.

14. The reflective liquid crystal device according to Claim 2, wherein unevenness is formed on a surface of the first substrate opposite to the second substrate.

15. A transflective liquid crystal device comprising:

a first transparent substrate;

a second transparent substrate opposed to the first substrate;

a liquid crystal held between the first and second substrates;

a light source provided on a side of the first substrate, which is opposite to the liquid crystal side thereof;

a transflective electrode layer arranged on the first substrate opposite to the second substrate;

a polarizer provided on a side of the second substrate, which is opposite to a first substrate side thereof;

a first retardation plate arranged between the polarizer and the second substrate; and

a second retardation plate arranged between the polarizer and the

first retardation plate;

wherein a twist angle of the liquid crystal is 230 to 260 degrees;

a minimum and maximum Δnd (product of optical anisotropy Δn and thickness d) of the liquid crystal are 0.85 μm or less and 0.70 μm or more, respectively;

Δnd of the first retardation plate is 150 ± 50 nm or 600 ± 50 m;

Δnd of the second retardation plate is 550 ± 50 nm;

an angle θ1 formed by a transmission axis or absorption axis of the polarizer and an optical axis of the second retardation plate is 15 to 35 degrees; and

an angle θ2 formed by an optical axis of the first retardation plate and the optical axis of the second retardation plate is 60 to 80 degrees.

16. A transflective liquid crystal device comprising:

a first transparent substrate;

a second transparent substrate opposed to the first substrate;

a liquid crystal held between the first and second substrates;

a light source provided on a side of the first substrate, which is opposite to the liquid crystal side thereof;

a transflective electrode layer arranged on the first substrate opposite to the second substrate;

a polarizer provided on a side of the second substrate, which is opposite to a first substrate side thereof;

a first retardation plate arranged between the polarizer and the second substrate; and

a second retardation plate arranged between the polarizer and the first retardation plate;

wherein a twist angle of the liquid crystal is 230 to 260 degrees;

a minimum and maximum Δnd (product of optical anisotropy Δn and thickness d) of the liquid crystal are 0.85 μm or less and 0.70 μm or more, respectively;

Δnd of the first retardation plate is 150 ± 50 nm;

Δnd of the second retardation plate is 610 ± 60 nm;

an angle θ1 formed by a transmission axis or absorption axis of the polarizer and an optical axis of the second retardation plate is 10 to 35 degrees; and

an angle θ2 formed by an optical axis of the first retardation plate and the optical axis of the second retardation plate is 30 to 60 degrees.

17. The transflective liquid crystal device according to Claim 15, wherein Δnd of the liquid crystal is 0.70 to 0.85 μm.

18. The transflective liquid crystal device according to Claim 16, wherein Δnd of the liquid crystal is 0.70 to 0.85 μm.

19. The transflective liquid crystal device according to Claim 15, further comprising a color filter provided on the liquid crystal side of the first or second substrate.

20. The transflective liquid crystal device according to Claim 16, further comprising a color filter provided on the liquid crystal side of the first or second substrate.

21. The transflective liquid crystal device according to Claim 15,

wherein the transflective electrode layer comprises a reflecting layer having a slit formed therein.

22. The transflective liquid crystal device according to Claim 16, wherein the transflective electrode layer comprises a reflecting layer having a slit formed therein.

23. The transflective liquid crystal device according to Claim 21, wherein the slit has a width of 3 to 20 μm.

24. The transflective liquid crystal device according to Claim 22, wherein the silt has a width of 3 to 20 μm.

25. The transflective liquid crystal device according to Claim 15, wherein the transflective electrode layer has a laminated structure comprising a transflective film, a transparent insulating film arranged on the transflective film, and a transparent electrode arranged on the insulating film.

26. The transflective liquid crystal device according to Claim 16, wherein the transflective electrode layer has a laminated structure comprising a transflective film, a transparent insulating film arranged on the transflective film, and a transparent electrode arranged on the insulating film.

27. The transflective liquid crystal device according to Claim 15, wherein a passive matrix driving system in a normally black mode is used.

28. The transflective liquid crystal device according to Claim 16, wherein a passive matrix driving system in a normally black mode is used.

29. The transflective liquid crystal device according to Claim 15, further comprising:

another polarizer arranged between the first substrate and the light source; and

another retardation plate arranged between the first substrate and the polarizer.

30. The transflective liquid crystal device according to Claim 16, further comprising:

another polarizer arranged between the first substrate and the light source; and

another retardation plate arranged between the first substrate and the polarizer.

31. The transflective liquid crystal device according to Claim 15, wherein unevenness is formed on a surface of the first substrate opposite to the second substrate.

32. The transflective liquid crystal device according to Claim 16, wherein unevenness is formed on a surface of the first substrate opposite to the second substrate.

33. An electronic apparatus comprising a reflective liquid crystal device according to Claim 1.

34. An electronic apparatus comprising a reflective liquid crystal device according to Claim 2.

35. An electronic apparatus comprising a transflective liquid crystal device according to Claim 15.

36. An electronic apparatus comprising a transflective liquid

crystal device according to Claim 16.